

EuroTube

Pioneering Research for Future Mobility



Our mission is to explore and develop cutting-edge mobility technologies that will pave the way for a more sustainable future.

We are taking on the major challenges of mobility that lie ahead: to transport passengers and goods swiftly, efficiently, and comfortably, all the while curbing emissions for climate protection.

In this quest for a sustainable future, hyperloop technology has emerged as the most promising solution.

Our focus centers on infrastructure, as it stands as the crucial catalyst for turning hyperloop from a visionary concept into a tangible reality. In the pages that follow, we outline our strategy and extend an invitation to companies, researchers, and traffic planners to join us on this groundbreaking journey toward a transformative future.



EuroTube Leadership
 (Left To Right) Doré de Morsier (founder & Chairman), Antoin Juge, Lorenzo Benedetti, Isabelle Beretta Piccoli

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Driving hyperloop innovation: EuroTube Foundation's vision for sustainable transport

The EuroTube Foundation is on a mission to propel the hyperloop technology into the forefront as the most promising sustainable transport mode of the future.

In the world of hyperloop technology, research is scattered across universities and businesses across the globe, lacking a cohesive network. We're here to change that.

We're bringing together research, education, and a network comprising industry giants, start-ups, and academia, all under one roof.

Collaborating with universities and companies worldwide, we are forming a Swiss hub to drive innovation and research.

The key to the next phase of innovation is ensuring that safety, efficiency, and sustainability are integral to the hyperloop journey from its inception.

2017
EuroTube launched as an association with the support of the Swiss state and ETH.

2019
EuroTube becomes a foundation and Swiss rail operator SBB joins the AlphaTube project as infrastructure co-developer.

2020 - 2021
Designated as Research Institute of National importance.

- The team of young researchers from all major scientific disciplines develops the engineering and design for a Swiss hyperloop test facility in the Canton of Valais.
- DemoTube demonstrator project launched as a step stone to the full AlphaTube test facility.

2023
DemoTube facility starts construction.

- Permit received to build DemoTube in Dübendorf, Switzerland
- Groundbreaking and start of component fabrication

2022
Finalisation of the technical design for DemoTube.

- Network of over 50 companies, and research collaborations with major Swiss universities.
- Hyperloop studies for the Federal Office of Transport and EuroAirport Basel

2024
DemoTube facility first operation.

2026
Planned start of construction for AlphaTube.



Our research focus: sustainable and scalable hyperloop infrastructure

1. Cost-efficient design and construction

Infrastructure represents the largest cost of the hyperloop system and, therefore, the biggest factor for cost reductions. At the same time, the infrastructure must remain very reliable over long periods of time. Hence, EuroTube is developing dedicated processes and innovative structural components that allow both to reduce cost and time for construction and maintenance.

¹Post tensioned segmented concrete tube design

A post-tensioning system, developed in collaboration with VSL Schweiz AG attains stable 20m tubes made of concrete segments. The design allows for flexible in-situ prefabrication with lower logistics costs, saving material and a consistent production process.

2. Minimizing the carbon footprint

In the shift towards sustainability, monitoring our emissions becomes crucial. The selection of construction materials and methods plays a pivotal role in determining overall emissions. Through extensive life-cycle analyses, EuroTube promotes the introduction of low-carbon materials and novel eco-friendly construction techniques. To further reduce energy consumption, we aim to strike a balance between minimizing environmental pressure inside the tube and the power demands of vacuum creation and maintenance.

3. Safety for passengers and cargo

Passengers prioritize safety when choosing transportation, and authorities will only approve hyperloop use once its safety is demonstrated and certified. EuroTube proactively embeds safety into its design process, aiming to achieve safety standards surpassing those of airplanes and trains.

³Aerodynamic analysis of shock propagation and reflection in the tube

Novel analytical solutions are key to estimate the maximum drag and energy requirement for the hyperloop vehicle to move along a long tube presenting end walls. The results will also help guide the design of systems to ensure a smoother and more energy-efficient travel inside the hyperloop tube.

²Circular steel-fibre reinforced concrete

Using a concrete mix with recycled aggregates allows for additional CO2 reduction. The concrete mix employs steel fibres to increase the toughness and reliability.

A show-case for hyperloop technology: DemoTube demonstrator



Innovationspark Zürich, Dübendorf

Conveniently located for access by Swiss and international research teams



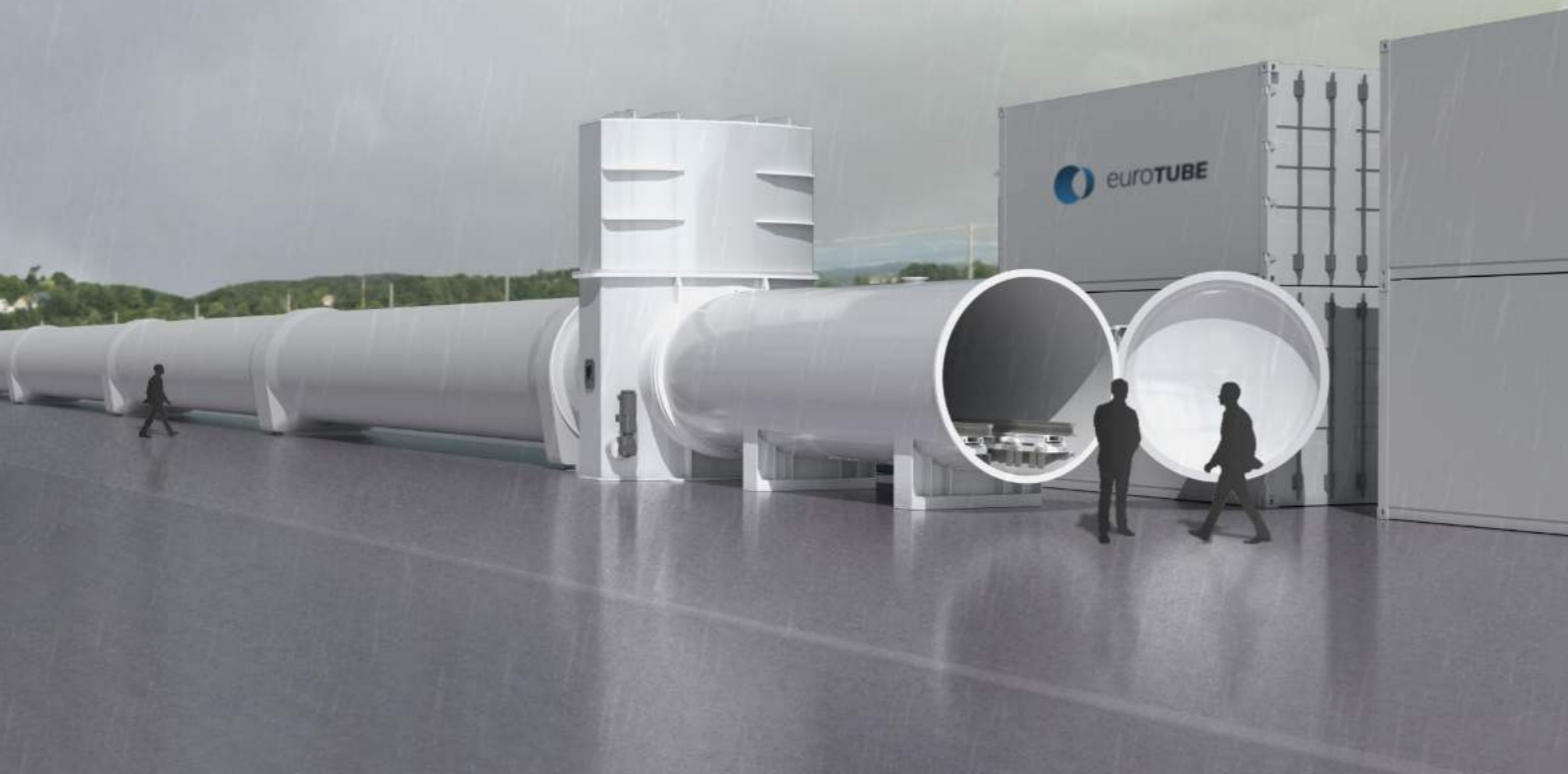
2.2m diameter low-speed test track (120km/h)

Proof of concept and to demonstrate scalability



2021-2024 Project Development

EuroTube developed all technology in-house with companies and research institutions



EuroTube findings confirmed that the major levers on making hyperloop technology safe, cost-efficient, and sustainable lie in the infrastructure. The single most defining feature of hyperloop are not necessarily the pod, but the tubes, that will span for thousand of kilometers and integrate all the mechanical and electrical components needed for vacuum, monitoring and maglev systems.

To close the existing technological gaps, develop new vehicles and test their reliability, EuroTube will set up test facilities, starting with DemoTube.

DemoTube has the objective to validate all the necessary components for Hyperloop, including safety systems, vacuum compatibility, airlock entry, and preliminary runs under vacuum conditions. This test infrastructure will be available to research groups and universities for their research work. Additionally, it will enable real world scenario product testing, in the civil, electrical and mechanical domains.

The construction of DemoTube will be conducted in three stages. Initially, the vacuum system and airlock will be realised, already allowing for testing capabilities.

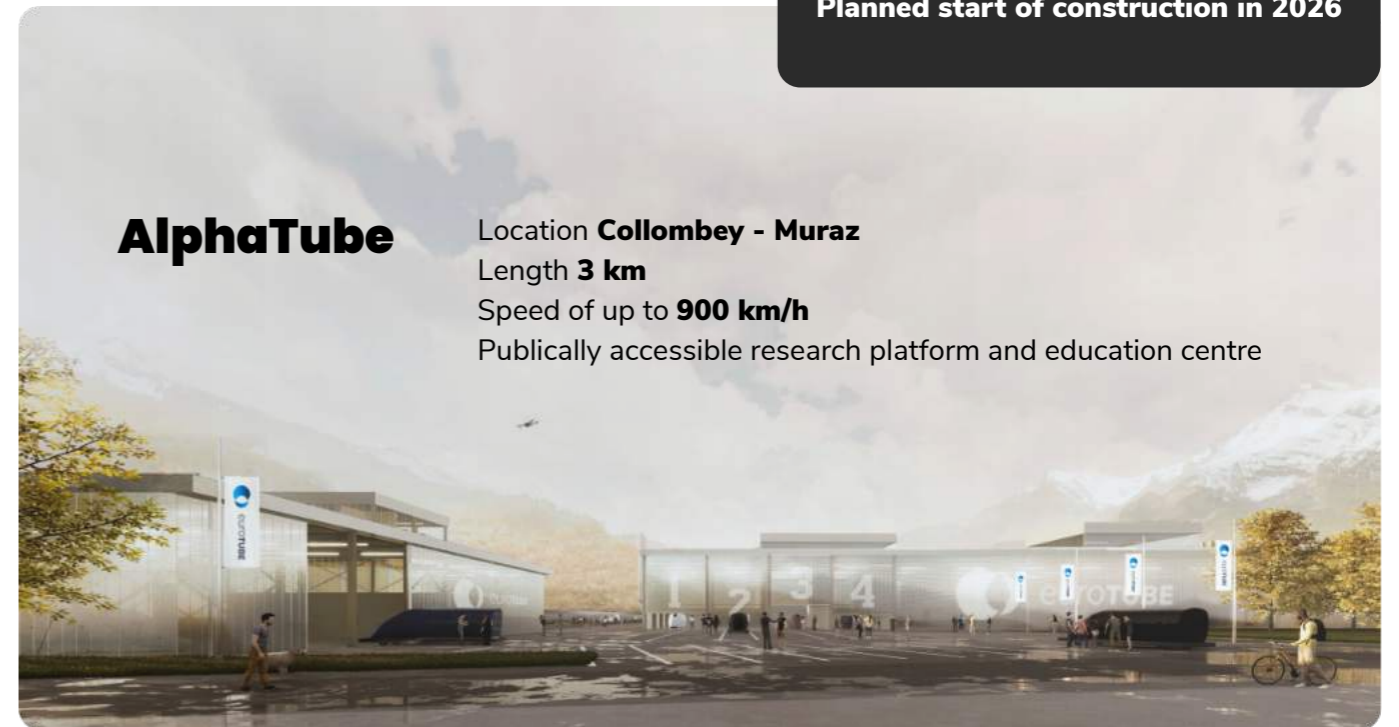
The following stage will comprise the construction of the concrete tube, including the inner track. Finally, in the third stage, the propulsion system and the sensor monitoring system will be installed, completing DemoTube.

Once EuroTube's systems are certified in DemoTube, AlphaTube will be built next. AlphaTube is EuroTube's mission to build the world's first high-speed hyperloop test track while demonstrating substantial cost reductions, thanks to the latest technological and manufacturing processes.

The 3km test track near Collombey-Muraz in Valais (CH) will be the proving ground for real case scenario testing with high-speed high-power launches and including simulations of emergency situations.

Both DemoTube and AlphaTube projects offer unique opportunities for research groups and for companies to develop and test their own solutions not only for hyperloop but also for a variety of other highly technical applications in controlled atmospheric environment.

Planned start of construction in 2026



AlphaTube

Location **Collombey - Muraz**

Length **3 km**

Speed of up to **900 km/h**

Publicly accessible research platform and education centre

Building a digital hyperloop

EuroTube started developing digital models in 2021 with the aim to underpin hyperloop scenarios with quantitative data regarding passenger flows, usage, and the environmental footprint over the life cycle. This analysis will also allow to identify hyperloop routes with the most potential in terms of demand, revenue and construction cost.

As a "hybrid digital twin" of physical infrastructures, our proprietary digital hyperloop model simulates the effects on transport mode choices and the optimal network design for a hyperloop as a complement to the existing transportation system.

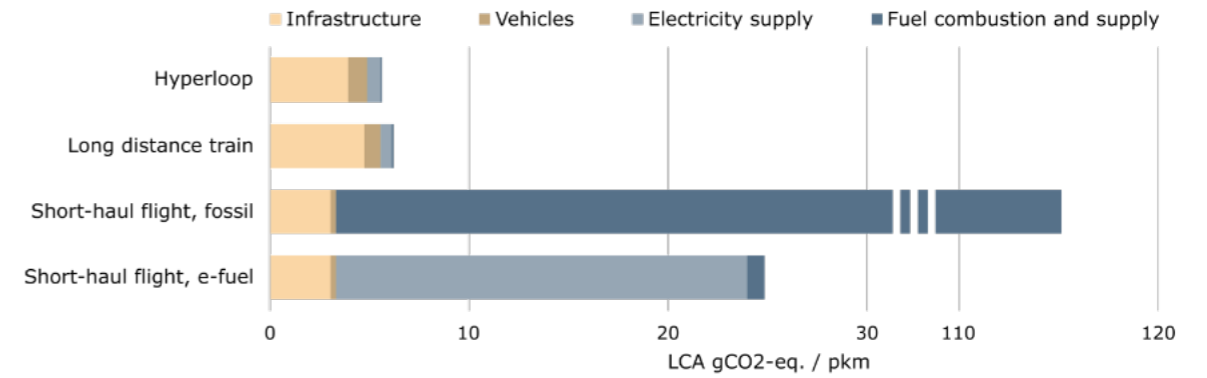
Use Case Passengers

We conduct comparative studies on future multi-modal passenger transport, encompassing demand prediction, network design, market estimation, ticket pricing, competition analysis, and integration with other modes of transportation.



System Design

Our dedicated numerical tools provide cost and capacity projection comparing various technology implementations in different hyperloop setups. Exploring across the spectrum of options helps identify pivotal technology breakthroughs, KPI sensitivities, and guides impactful decisions, streamlining development.



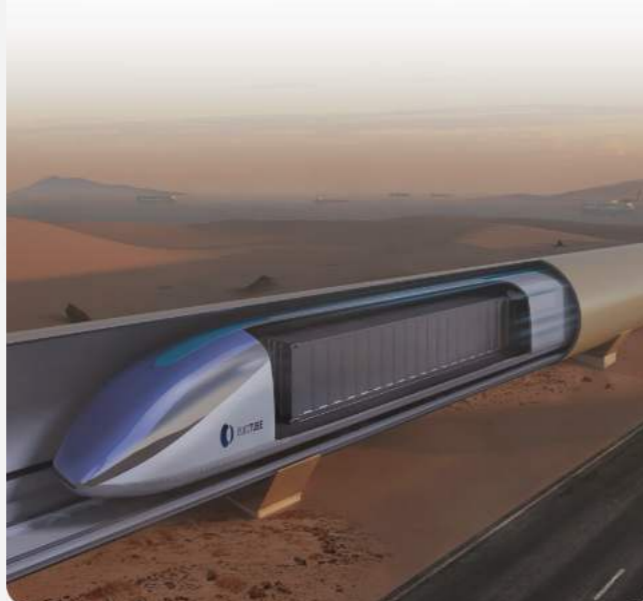
Environmental Analysis

Through life-cycle analyses, we estimate energy consumption, GHG emissions and identify potential design improvements.



Use Case Freight

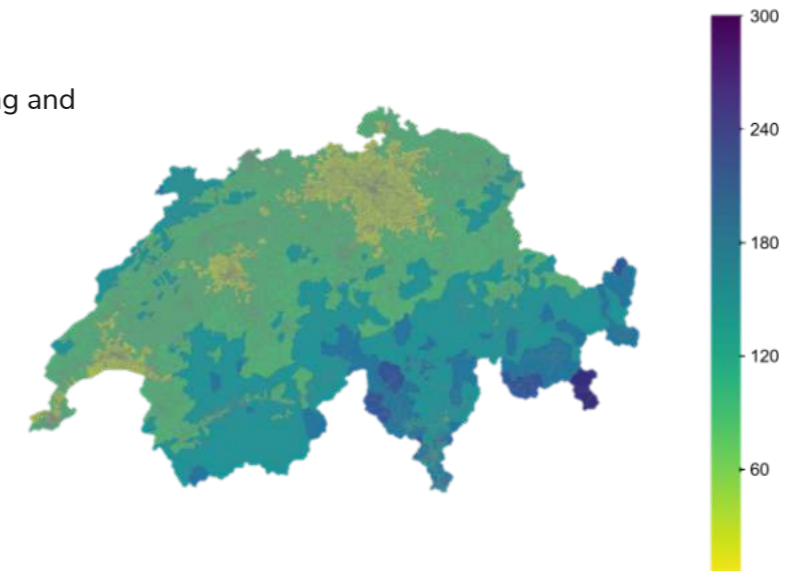
We evaluate cargo business cases and estimate emission savings.



Hyperloop Operation

We estimate capacities, fleet sizing and assess operation costs.

Minutes to reach Zurich with Swiss hyperloop line connecting Geneva, Lausanne, Berne, and Zurich.



We have the tools, quantitative data, and expertise to help with your research challenge for logistics or passenger transport. → **get in touch with info@eurotube.org**

